

**ABSTRACT OF THE DISCLOSURE**

5 The present invention is directed to a method of manufacturing silicide used to reduce a contact resistance at a contact of a semiconductor device and a semiconductor device with the silicide manufactured by the same method. The method comprises the steps of: (a) cleaning a semiconductor substrate with a transistor formed thereon, the transistor including a source electrode, a drain electrode and a gate electrode; (b) placing the cleaned semiconductor substrate into a sputter chamber in a deposition equipment, and forming silicide at the same time of depositing a metal film under a state where the semiconductor substrate is heated at a temperature of 450 - 600°C; (c) removing residual metal film not used for the formation of silicide; and (d) annealing the semiconductor substrate. According to the present invention, since silicide is formed at the same time of depositing a cobalt film, there is an advantage of omission of a protection film formation process over the prior arts where silicide is formed by a post-heat treatment.